



ARIZONA DEPARTMENT
OF HEALTH SERVICES

Cara M. Christ, MD, Director

BUREAU OF EMERGENCY MEDICAL SERVICES AND TRAUMA SYSTEM

EMERGENCY MEDICAL SERVICES 2019 ANNUAL REPORT



Bureau of Emergency Medical Services and Trauma System

Terry Mullins, MBA, MPH, Bureau Chief

Gail Bradley, MD, Medical Director

Benjamin Fisher, MPA, NRP, Services Section Chief

Vatsal Chikani, MPH, BHMS, Epidemiological Data and Quality Assurance Manager

Sri Vidya Mahankali, MS, Bioinformatics, Senior Epidemiologist

Mary Benkert, Trauma Data Administrator

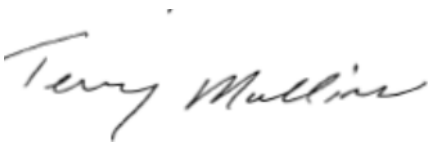
Anne Vossbrink, MS, EMS Data Administrator

INTRODUCTION

On behalf of the Bureau of EMS and Trauma System, we are pleased to present the 2019 EMS Annual Report. This document is a record of system-level EMS activity reported by 151 EMS agencies for the 2018 reporting year. Highlights of this report include the following:

- 151 Arizona EMS agencies responded to 678,000 9-1-1 calls last year and transported 60% of those. Another 159,000 Arizonans were transported between healthcare facilities by EMS for medical care.
- Children under the age of 14 make up 18% of Arizona's population but account for just fewer than 4% of run volume. This highlights the fact that our EMS providers are called to treat sick children at a low frequency and the importance of creating and supporting pediatric specific education for our EMCTs.
- Folks over the age of 55 account for 29% of Arizona's population and 57% of the call volume. Just the opposite situation exists for Arizona's senior population. They are dramatically over-represented in health care. EMS must work hard to ensure that they are appropriately assessing older patients and taking into account their special needs when deciding on the best hospital for their care.
- EMS Provider documentation of Primary Impression has improved significantly (37% in 2014 and 7.31% in 2018). The ability of an EMS agency to perform continuous quality improvement activities with staff is only as strong as the documentation. This very positive change over the past 4 years points to an enhanced CQI capability across the state.
- Thirty percent of patients transported to a hospital are admitted. While there may be agency to agency variation, it is clear that people who dial 911 are frequently quite ill. Now with more and more discussion about treat and refer and community paramedicine, it is very important to make sure your staff have strong continuing education opportunities related to medical assessment and treatment.

This report is dedicated to the 19,000 Emergency Medical Care Technicians providing 24 hour a day care to Arizona citizens.



Terry Mullins, Chief



Gail Bradley, Medical Director

Aerocare Med. Transport System (Scottsdale)	Daisy Mountain Fire District
AeroCare Medical Transport (AMRG)	Desert Hills Fire Dist.
Air EMS, Inc.	Douglas Fire Department
Air Evac Svcs.	El Mirage Fire Dept
Arizona Lifeline	Elfrida Ambulance Svc.
Classic Air Medical	Eloy Fire District Ambulance Svc.
DPS - Department of Public Safety (Air Rescue AZ)	Flagstaff Fire Dept.
Eagle Air Med TAB008 74	Florence Fire Dept.
Guardian Air (Flagstaff)	Fort Mojave Mesa Fire Dept
LifeNet (Arizona)	Fry Fire District
Native American Air Ambul. – OMNI Flight	Ganado Fire District
Tri State Care Flight, LLC	Gila Bend Rescue / Ambulance
ABC Ambulance	Gilbert Fire & Rescue Department
Action Medical Svc. - Ganado	Glendale Fire Dept.
Action Medical Svc. - Winslow	Globe Fire Dept
Ajo Ambulance	Golden Valley Fire Dist.
Alpine Fire Dist.	Golder Ranch Fire District
American Ambulance	Goodyear Fire Dept.
American Comtrans	Grand Canyon Nat. Park Fire Dept.
American Medical Response Maricopa, LLC	Green Valley Fire District
AMR Pinal	Greer Fire District
AMR Tucson	Groom Creek Fire Dist.
Arivaca Fire Dist.	Guardian Medical Transport
ARIZONA AMBULANCE TRANSPORT	Healthcare Innovations
Arizona City Fire Dist.	Heber-Overgaard Fire District
Arizona State University EMS	Holbrook EMS
Arrowhead Fire and Medical Authority, Inc.	Hualapai Nation Emergency Services
Avodale Fire & Medical Department	Kingman Fire Dept., City
Avra Valley Fire District	Lake Mohave Ranchos Fire District
Beaver Dam-Littlefield Fire District	Life Line Ambulance Service
Bisbee Fire Dept.	Life Line Central
Blue Ridge Fire Dept.	Life Line Payson
Buckeye Fire Department	Life Line Pinal
Buckeye Valley Rural Vol. Fire Dist.	Life Line Safford
Buckskin Fire Department	Maricopa Ambulance LLC
Bullhead City Fire Department	Maricopa County Sheriff's Office (MCSO)
Casa Grande Fire Dept., City of	Maricopa Fire Dept.
Central Arizona Fire Medical Authority	Mayer Fire Department
Chandler Fire Department	McMullen Valley Fire Dist
Chinle Community Fire Dept.	Mesa Fire and Medical Department
Colorado City Fire Dept.	Mohave Valley Fire Dept
Congress Fire Dist.	
Copper Canyon Fire and Medical Authority	
Cottonwood Fire and Medical Dept.	

Mormon Lake Fire Dist
 Navajo Nation EMS - Fort Defiance
 Navajo Nation EMS - Inscription House
 Navajo Nation EMS - Kayenta
 Navajo Nation EMS - Pinon
 Navajo Nation EMS - Red Mesa
 Navajo Nation EMS - Winslow
 Nogales Ambulance Svc. (Nogales Fire)
 North County Fire & Medical District
 Northern Arizona Consolidated Fire Dept (NACFD)
 Northwest Fire Rescue Dist.
 Palominas Fire Dist.
 Payson Fire Dept.
 Peoria Fire- Medical Department
 Picture Rocks Fire & Medical District
 Pine/Strawberry Fire Dept.
 Prescott Fire Dept.
 Puerco Valley Ambulance Svc.
 Quartzsite Fire Dist.
 Queen Creek Fire Dept
 Regional Fire and Rescue Dept.
 Rincon Valley Fire District
 Rio Rico Fire District
 Rio Verde Fire District
 River Medical, INC
 Rural Metro Fire Maricopa
 Rural Metro Fire Pima
 Rural Metro Fire Yuma
 Sacred Mountain Medical Svc.
 San Luis Fire Department
 Sedona Fire District
 Sierra Vista Fire & Medical Department
 Scottsdale Fire Department
 Somerton Fire Dept.
 Sonoita-Elgin Fire District
 South County Fire and Medical District
 Southwest Ambulance (Maricopa)
 Southwest Ambulance and Rescue
 Sun City Fire & Medical Department
 Sunsites-Pearce Fire District
 Superstition Fire/Medical District
 Surprise Fire-Medical Department
 Tempe Fire Dept.
 Three Points Fire District
 Timber Mesa Fire and Medical District
 Tohono O'odham Nation EMS
 Tolleson Fire Dept.

Tombstone Fire Dept.
 Tonopah Valley Fire Dist.
 Tri-Valley Ambulance Svc.
 Tubac Fire District Ambulance Svc.
 Tucson Fire Department
 University of Arizona Emergency Medical Services
 Verde Valley Ambulance Co.
 Vernon Fire Dist.
 White Mountain Ambulance Svc.
 White Mountain Apache Tribe EMS
 White Mountain Lakes Fire Dist.
 Wickenburg Fire Department
 Williamson Valley Fire Dist.
 Yarnell Fire Dist.
 Yucca Fire Dist.
 Yuma Fire Department

BACKGROUND

The purpose of this report is to systematically describe EMS calls occurring in Arizona in the year 2018.

This report will provide the descriptive statistics of EMS run volume and EMS run rates by various factors like age, gender, county etc. The report is divided into 911 EMS incidents and interfacility transfers, providing separate descriptive statistics for both.

We have synthesized data from the Arizona Prehospital Information & EMS Registry System (AZ-PIERS) and the Hospital Discharge Database (HDD) to provide stakeholders with key information on Arizona's EMS patients.

AZ-PIERS is a free, electronic Patient Care Records (ePCRs) registry that allows EMS agencies to collect and transmit records to the State. The primary purpose of AZ-PIERS is to optimize prehospital care through a data driven, quality assurance approach. AZ-PIERS capture agency information, patient demographics, response times, incident location, and prehospital treatment.

METHODS

In 2018, 151 EMS agencies were submitting data to the AZ-PIERS. A total of 942,423 EMS incidents were submitted to AZ-PIERS from January 1, 2018 to December 31, 2018.

We used the 2018 population denominators, from the Arizona Health Status and Vital Statistics database¹ to calculate EMS run rates per 100,000 Arizona residents. These data were analyzed using SAS software, version 9.4 (SAS Institute, Cary, NC).

The primary and secondary impressions from the EMS diagnosis field were categorized using IC-10 and Clinical Classifications Software (CCS) categories². Refer to appendix B for more details. In order to obtain the final hospital outcome for EMS incidents with an incident disposition of Treated & Transported, a deterministic linkage between AZ-PIERS and the Hospital Discharge Database (HDD) was performed. A total of 520,373 Treated/Transported EMS incidents qualified for linkage between AZ-PIERS and the HDD. Incidents not qualifying for linkage consisted of patients who were transported to facilities not reporting to the HDD, facilities outside of Arizona, or had missing data on all linkage variables. Following linkage, 494,742 (95%) EMS incidents were successfully matched to their respective records in the HDD.

1. Arizona Department of Health Services, Population Health and Vital Statistics. Population Denominators: 2018. <http://pub.azdhs.gov/health-stats/menu/info/pop/index.php>

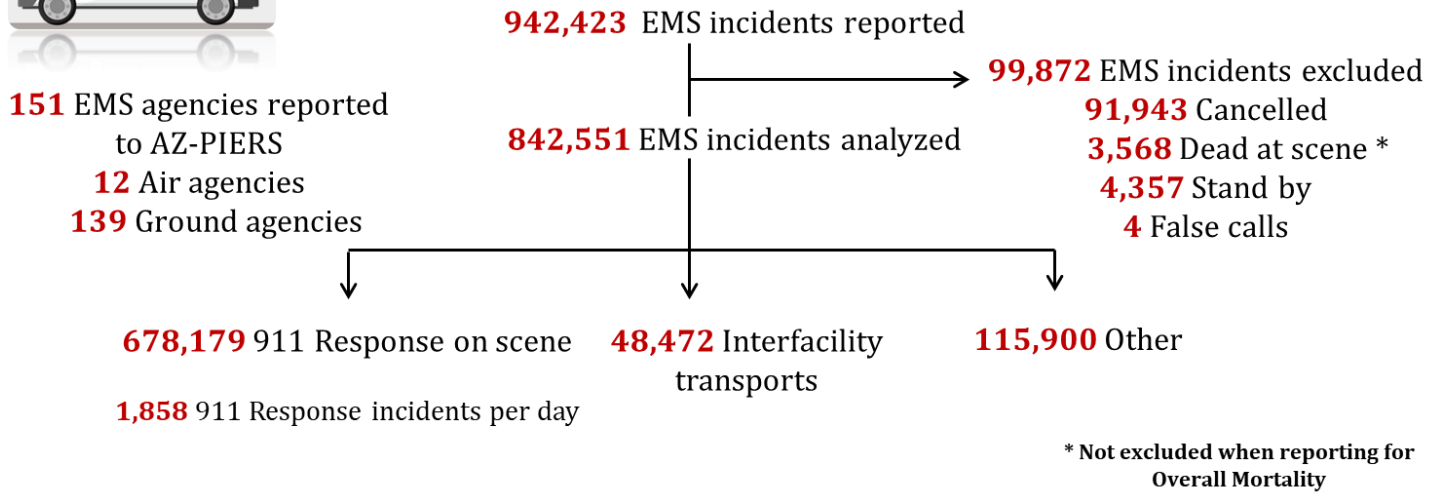
2. https://www.hcup-us.ahrq.gov/toolssoftware/ccsr/ccs_refined.jsp

LIST OF TABLES & FIGURES

Type of EMS Call Requests	8
Figure 1/Table 1: Type of EMS call requests	8
911 EMS Incidents - Summary	9
Figure 2: Distribution of 911 EMS incidents by month.....	9
Figure 3: Distribution of 911 EMS incidents by day of the week	9
911 EMS Incidents - Incident Disposition	10
Figure 4/Table 2: Incident disposition of 911 EMS incidents	10
911 EMS Incidents - Age	11
Figure 5: Age - specific distribution of 911 EMS incidents and Arizona population.....	11
Figure 6: Age - specific 911 EMS incident rate per 100,000	11
Table 3: Age - specific 911 EMS incidents and EMS incident rate per 100,000	11
911 EMS Incidents - Gender	12
Table 4: Gender - specific 911 EMS incidents	12
Figure 7: Gender - specific 911 EMS incident percent	12
911 EMS Incidents - County.....	13
Figure 8: County - specific 911 EMS incident rate per 100,000	13
Table 5: County - specific 911 EMS incidents and incident rate per 100,000	13
Figure 9/Table 6: Urban/Rural 911 EMS incident rate per 100,000.....	13
911 EMS Incidents - Treated and Transported	14
Figure 10/Table 7: 911 EMS incidents - Hospital discharge status.....	14
Interfacility Transports - Summary	15
Figure 11: Interfacility transports by month	15
Interfacility Transports - Age	15
Figure 12/Table 8: Age - specific interfacility transports.....	15
Interfacility Transports - County	16
Figure 13: County - specific interfacility transport rate per 100,000	16
Table 9: County - specific interfacility transports and transport rate per 100,000.....	16
Figure 14/Table 10: Urban/Rural interfacility transfer rate per 100,000.....	16
Overall Mortality - In Hospital Death Vs On Scene Death	17
Figure 15/Table 11: In hospital deaths vs On scene.....	17
Provider Primary and Secondary Impression Categories Of Interest	18
Figure 16/Table 12: Prevalence of primary and secondary impression categories of interest.....	18
Figure 17/Table 13: Deaths by primary and secondary impression categories of interest.....	18
Appendix A. Definitions	19
Appendix B. Provider Primary and Secondary Impression Categories Criteria	20-21



EMS 2018 Data



TYPES OF EMS CALL REQUESTS (N = 842,551)

Figure 1: Type of EMS call requests

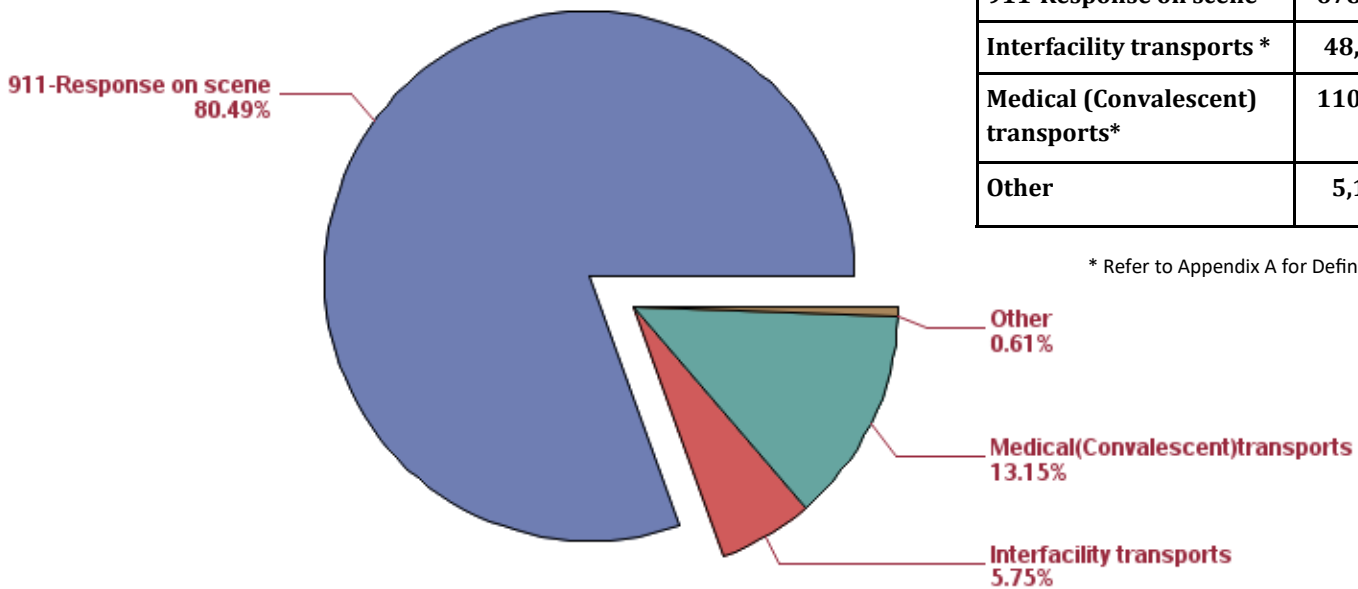


Table 1: Type of EMS call requests

Type of Service Request	EMS incidents	EMS incident %
911-Response on scene *	678,179	80.49%
Interfacility transports *	48,472	5.75%
Medical (Convalescent) transports*	110,765	13.15%
Other	5,135	0.61%

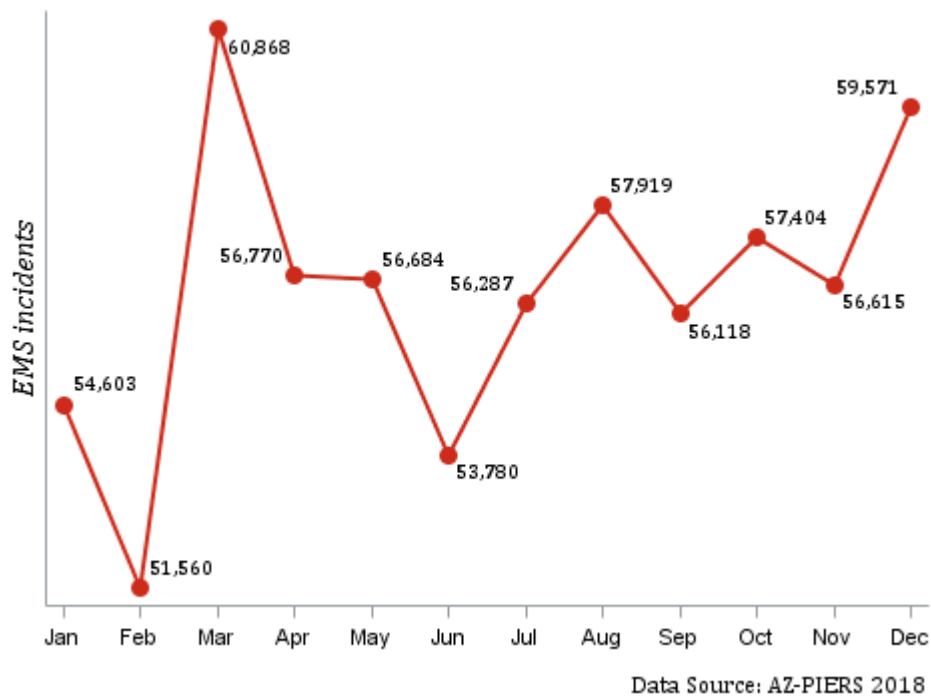
* Refer to Appendix A for Definition

Data source: AZ-PIERS 2018

911 EMS INCIDENTS (N = 678,179) - SUMMARY

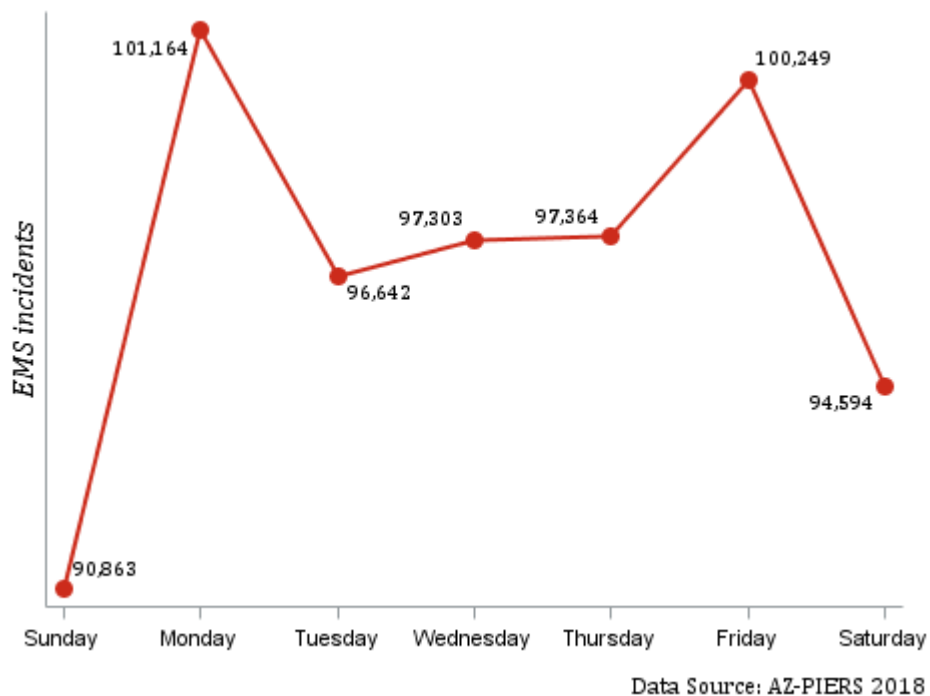
DISTRIBUTION OF 911 EMS INCIDENTS BY MONTH

Figure 2: Distribution of 911 EMS incidents by month



DISTRIBUTION OF 911 EMS INCIDENTS BY DAY OF THE WEEK

Figure 3: Distribution of 911 EMS incidents by day of the week

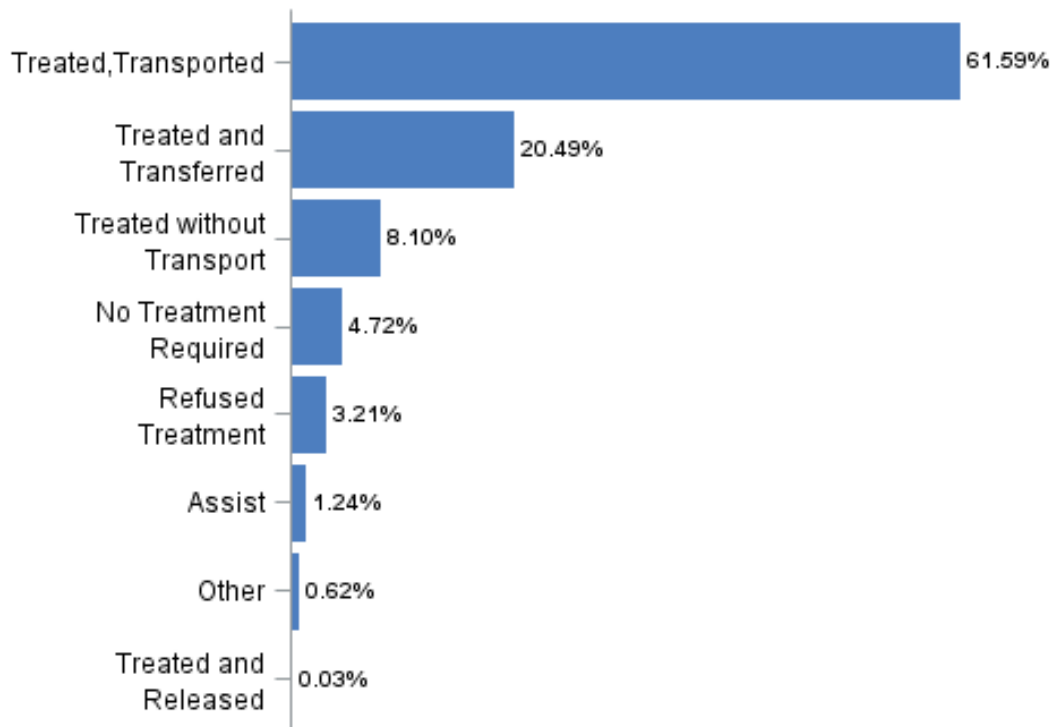


911 EMS INCIDENTS - INCIDENT DISPOSITION *

Table 2: Incident disposition of 911 EMS incidents

<i>Incident disposition</i>	<i>EMS incidents</i>	<i>EMS incident %</i>
Treated, Transported	417,666	61.59%
Treated and Transferred	138,976	20.49%
Treated without Transport	54,963	8.10%
No Treatment Required	32,039	4.72%
Refused Treatment	21,737	3.20%
Assist	8,384	1.24%
Other	4,180	0.62%
Treated and Released	234	0.03%

Figure 4: Incident disposition of 911 EMS incidents



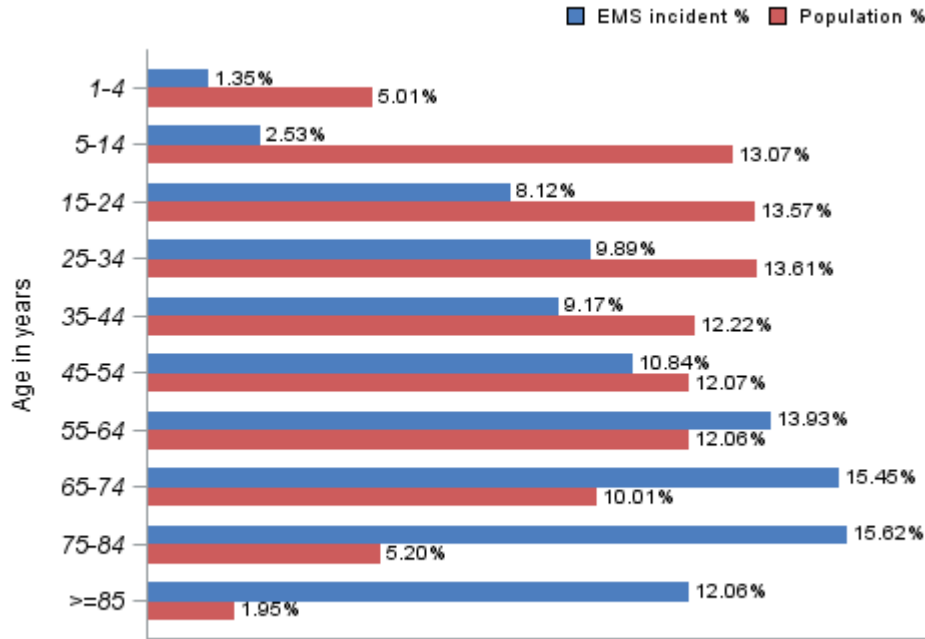
Data Source: AZ-PIERS 2018

* Refer to Appendix A for more information

911 EMS INCIDENTS - AGE

DISTRIBUTION OF 911 EMS INCIDENTS AND ARIZONA POPULATION

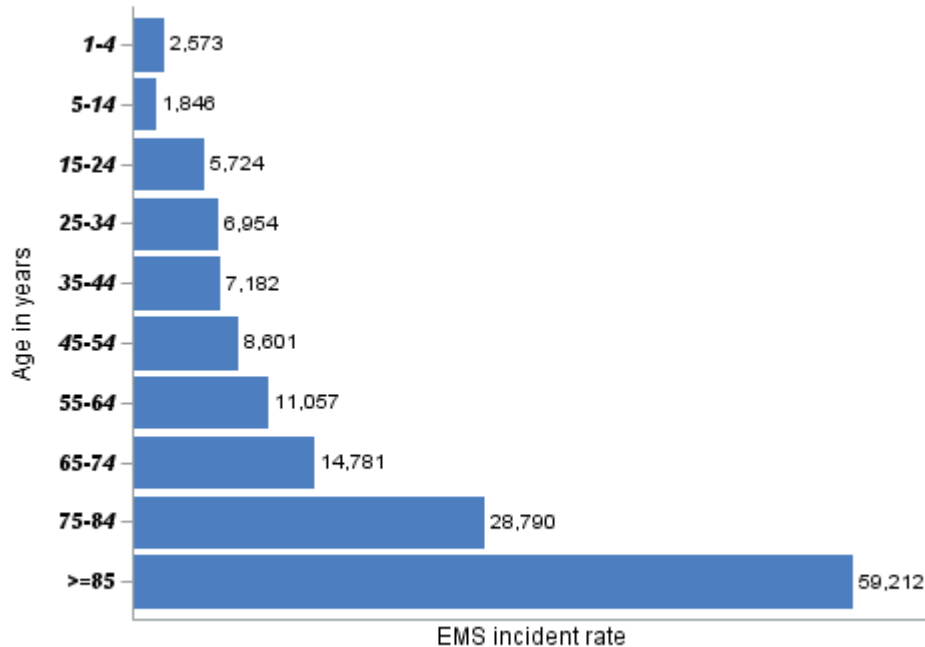
Figure 5: Age - specific distribution of 911 EMS incidents and Arizona population



Data Source: AZ-PIERS 2018, Arizona Health status and Vital Statistics 2018

911 EMS INCIDENT RATE PER 100,000 BY AGE

Figure 6: Age - specific 911 EMS incident rate per 100,000



Data Source: AZ-PIERS 2018

Table 3: Age - specific 911 EMS incidents and EMS incident rate per 100,000

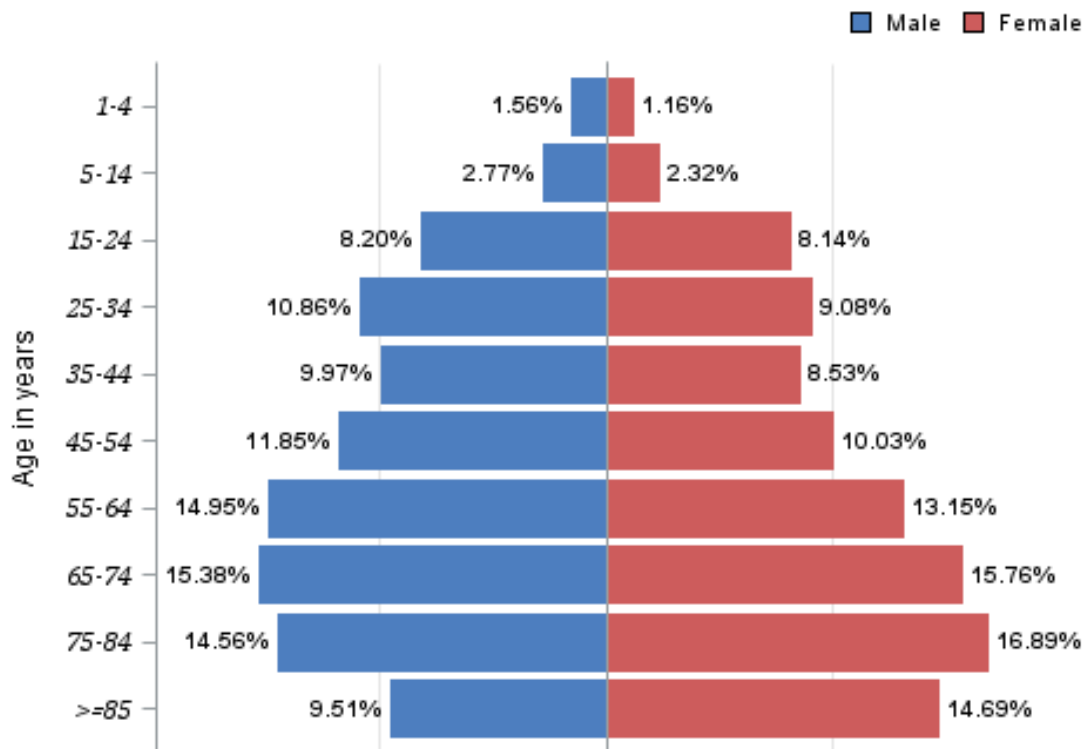
Age	EMS Incidents	EMS incident %	Arizona population	EMS incident rate
Missing	7,731	1.14%	.	.
1-4	9,125	1.35%	354,651	2,573
5-14	17,073	2.52%	924,789	1,846
15-24	54,965	8.10%	960,224	5,724
25-34	66,977	9.88%	963,179	6,954
35-44	62,126	9.16%	865,010	7,182
45-54	73,461	10.83%	854,104	8,601
55-64	94,385	13.92%	853,660	11,057
65-74	104,716	15.44%	708,474	14,781
75-84	105,869	15.61%	367,723	28,790
>=85	81,751	12.05%	138,064	59,212

911 EMS INCIDENTS - GENDER

Table 4: Gender - specific 911 EMS incidents

<i>Gender</i>	<i>EMS incidents</i>	<i>EMS incident %</i>	<i>Mean age</i>
Female	344,302	50.56%	58.49 years
Male	329,280	48.20%	54.75 years
Not Recorded	9,054	1.24%	N/A

Figure 7 : Gender - specific 911 EMS incident percent

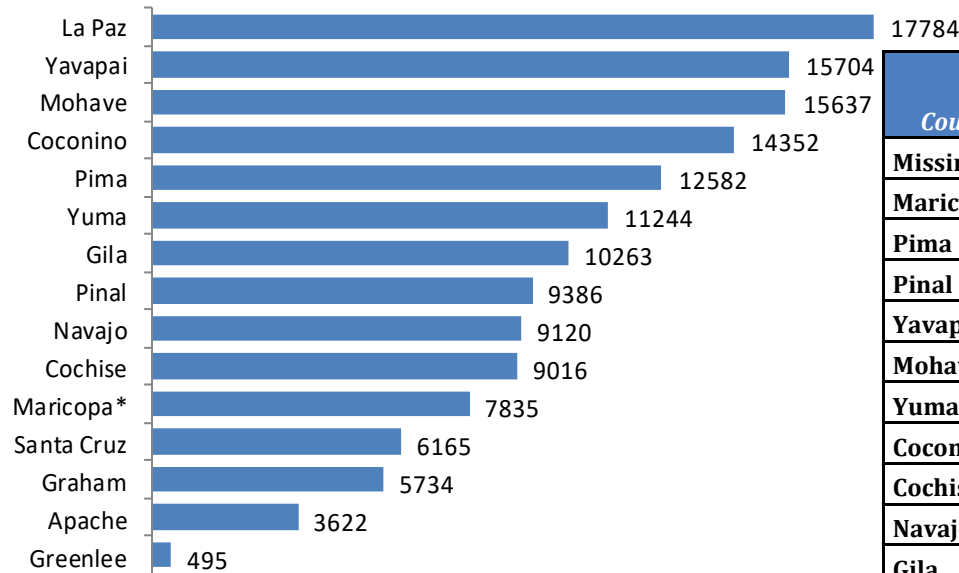


Data Source: AZ-PIERS 2018

911 EMS INCIDENTS - COUNTY

911 EMS INCIDENTS DISTRIBUTION BY COUNTY

Figure 8: County - specific 911 EMS incident rate per 100,000



Data source: AZ-PIERS 2018

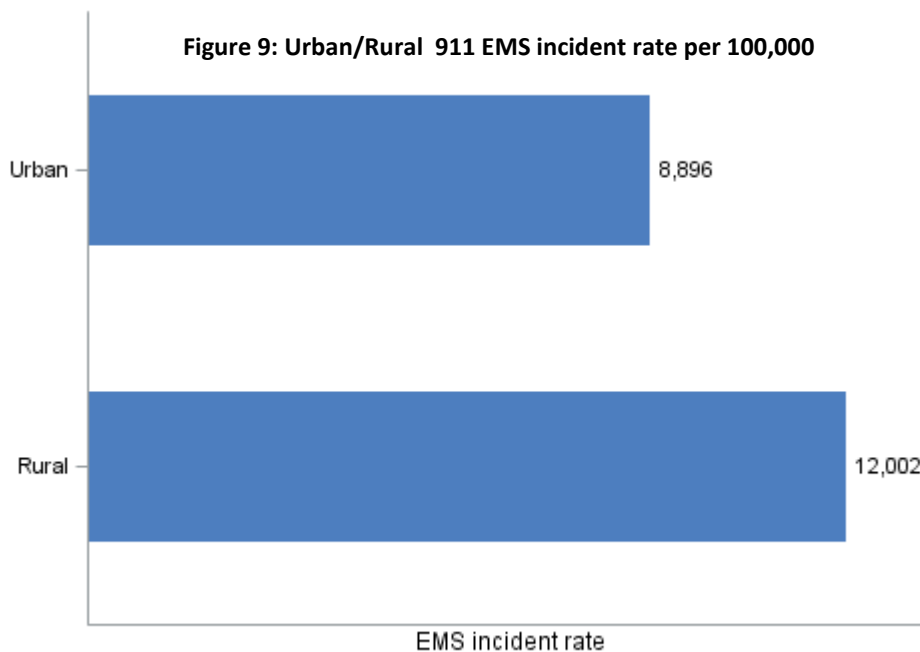
* Maricopa does not include data from Phoenix Fire

Table 5: County - specific 911 EMS incidents and incident rate per 100,000

County	EMS incidents	EMS incident %	Arizona population	EMS incident rate
Missing	14,155	1.68%	N/A	N/A
Maricopa*	336,476	39.94%	4,294,460	7,835
Pima	130,122	15.45%	1,034,201	12,582
Pinal	41,354	4.91%	440,591	9,386
Yavapai	35,957	4.27%	228,970	15,704
Mohave	33,299	3.96%	212,948	15,637
Yuma	25,322	3.01%	225,212	11,244
Coconino	20,891	2.48%	145,564	14,352
Cochise	11,750	1.39%	130,319	9,016
Navajo	10,282	1.22%	112,746	9,120
Gila	5,639	0.67%	54,946	10,263
La Paz	3,893	0.46%	21,890	17,784
Santa Cruz	3,230	0.38%	52,390	6,165
Apache	2,656	0.32%	73,330	3,622
Graham	2,186	0.26%	38,126	5,734
Greenlee	52	0.01%	10,506	495
Out of State	915	0.11%	N/A	N/A

911 EMS INCIDENTS DISTRIBUTION BY URBAN/RURAL COUNTIES

Figure 9: Urban/Rural 911 EMS incident rate per 100,000



Data Source: AZ-PIERS 2018

Table 6: Urban/Rural 911 EMS incidents and incident rate per 100,000

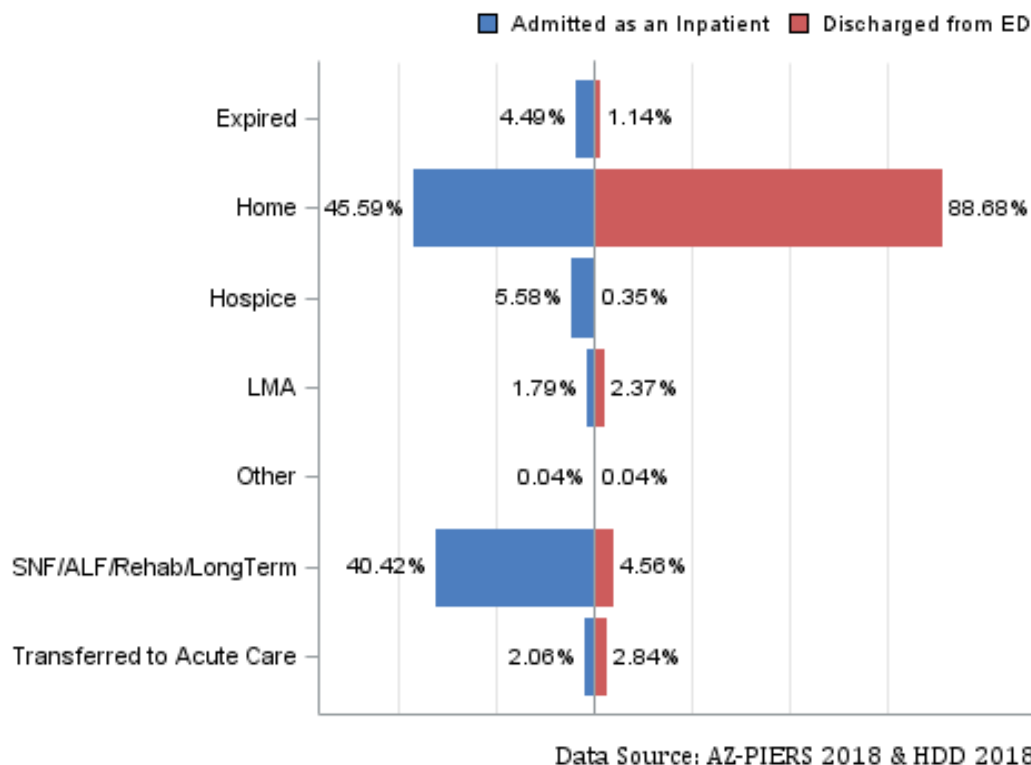
Urban / Rural	EMS incidents	EMS incident%	EMS incident rate
Missing	14,155	1.68%	N/A
Urban *	533,274	63.33%	8,896
Rural	129,835	15.42%	12,002
Out of State	915	0.11%	N/A

* Urban does not include data from Phoenix Fire

911 EMS INCIDENTS - TREATED AND TRANSPORTED (N= 417,666)

911 EMS INCIDENTS TREATED AND TRANSPORTED - HOSPITAL DISCHARGE STATUS

Figure 10: 911 EMS incidents - Hospital discharge status



388,259 (93%) 911 EMS incidents were successfully matched to their respective records in HDD.

259,690 (62.2%) of the EMS incidents were discharged from ED while 128,569 (30.8%) were Admitted as Inpatient in the destination hospital.

29,407 EMS incidents had missing Hospital Discharge status

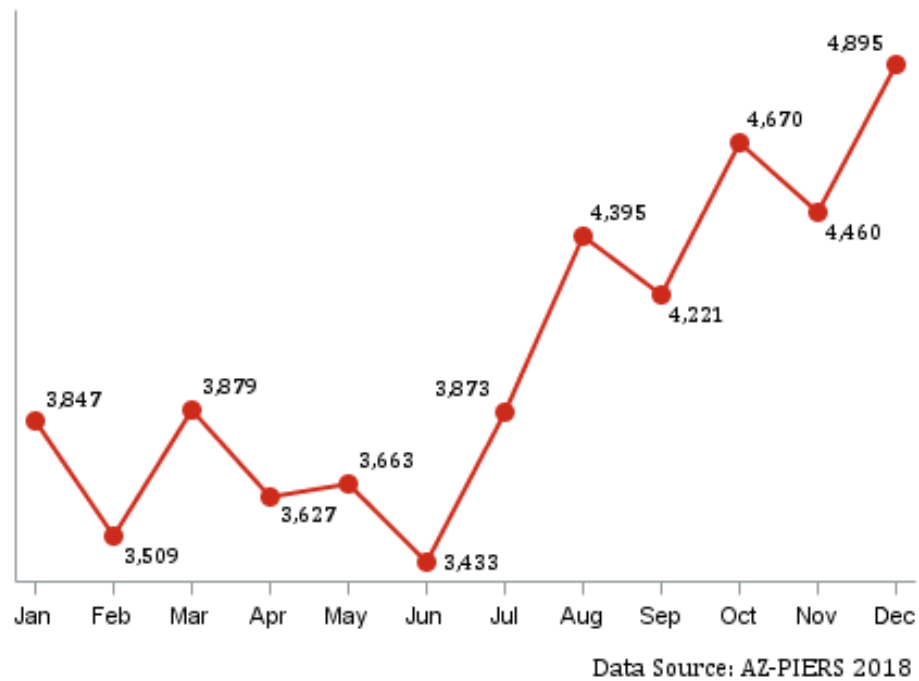
Table 7: 911 EMS incidents - Hospital discharge status

Discharge Status	Admitted as Inpatient		Discharged from ED	
	EMS incidents	EMS incident %	EMS incidents	EMS incident %
Expired	5,778	4.49%	2,967	1.14%
Home	58,615	45.59%	230,312	88.69%
Hospice	7,187	5.59%	914	0.35%
LMA	2,310	1.80%	6,157	2.37%
Other	54	0.04%	116	0.04%
SNF/ALF/Rehab/LongTerm	51,968	40.42%	11,845	4.56%
Transferred to Acute Care	2,657	2.07%	7,379	2.84%
Total	128,569		259,690	

INTERFACILITY TRANSPORTS (N = 48,472)

INTERFACILITY TRANSPORTS - DISTRIBUTION BY MONTH

Figure 11: Interfacility transports by month



INTERFACILITY TRANSPORTS - AGE

Figure 12: Age - specific interfacility transports

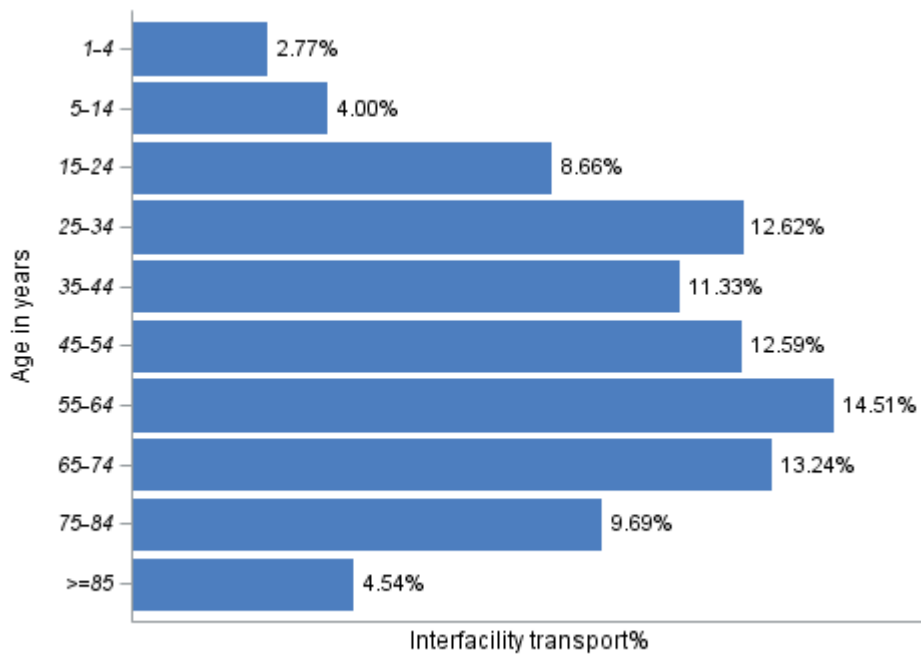


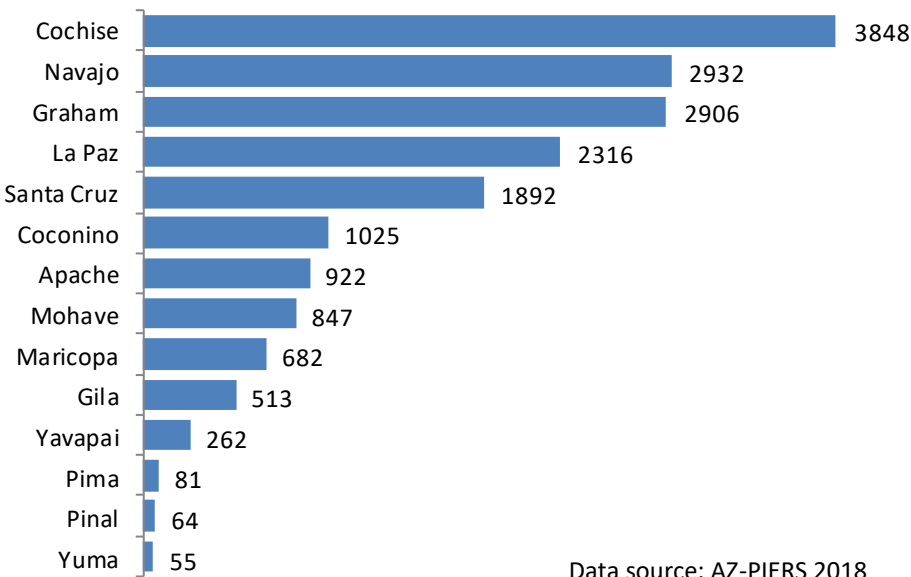
Table 8: Age - specific interfacility transports

Age	Transports	Transport %
Missing	2,935	6.06%
01-4	1,341	2.77%
05-14	1,941	4.00%
15-24	4,196	8.66%
25-34	6,115	12.62%
35-44	5,490	11.33%
45-54	6,104	12.59%
55-64	7,035	14.51%
65-74	6,416	13.24%
75-84	4,696	9.69%
>=85	2,203	4.54%

INTERFACILITY TRANSPORTS - COUNTY

INTERFACILITY EMS RUN DISTRIBUTION BY COUNTY

Figure 13: County - specific interfacility transports rate per 100,000



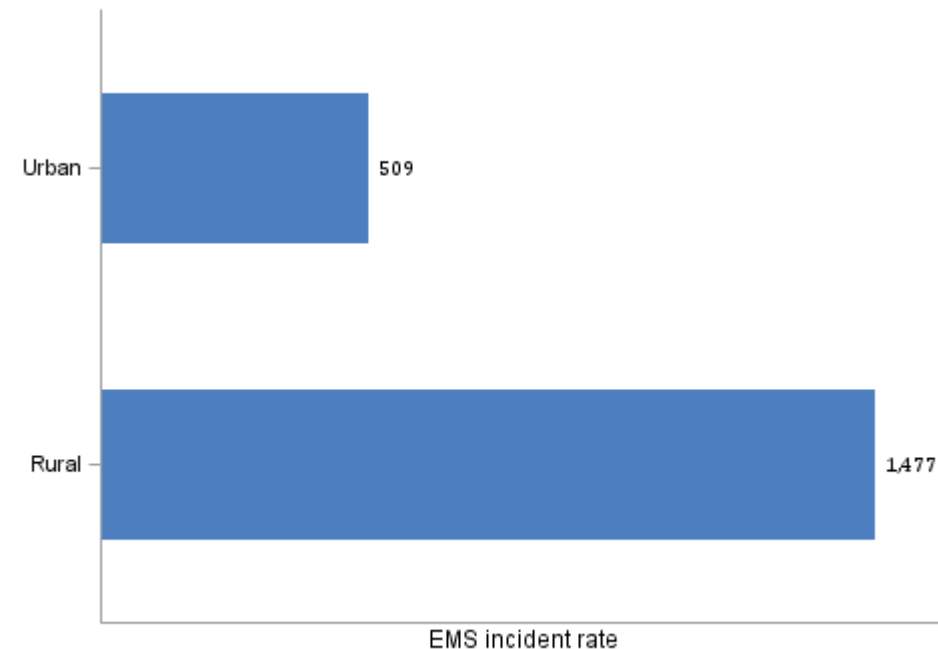
* Maricopa does not include data from Phoenix Fire

Table 9: County - specific interfacility transports and transport rate per 100,000

County	Trans-ports	Transport %	Arizona population	Rate per 100,000
Missing	1,804	2.97%	N/A	N/A
Apache	676	1.40%	73,330	922
Cochise	5,015	10.69%	130,319	3,959
Coconino	1,492	3.09%	145,564	1,025
Gila	282	0.58%	54,946	513
Graham	1,108	2.30%	38,126	2,906
La Paz	507	1.05%	21,890	2,316
Maricopa *	29,290	60.43%	4,294,460	682
Mohave	1,804	3.99%	212,948	904
Navajo	3,306	6.82%	112,746	2,930
Pima	835	1.73%	1,034,201	81
Pinal	281	0.58%	440,591	64
Santa Cruz	991	2.05%	52,390	1,892
Yavapai	599	1.24%	228,970	262
Yuma	123	0.25%	225,212	55
Out of State	166	0.34%	N/A	N/A

URBAN/RURAL

Figure 14: Urban/Rural interfacility transports rate per 100,000



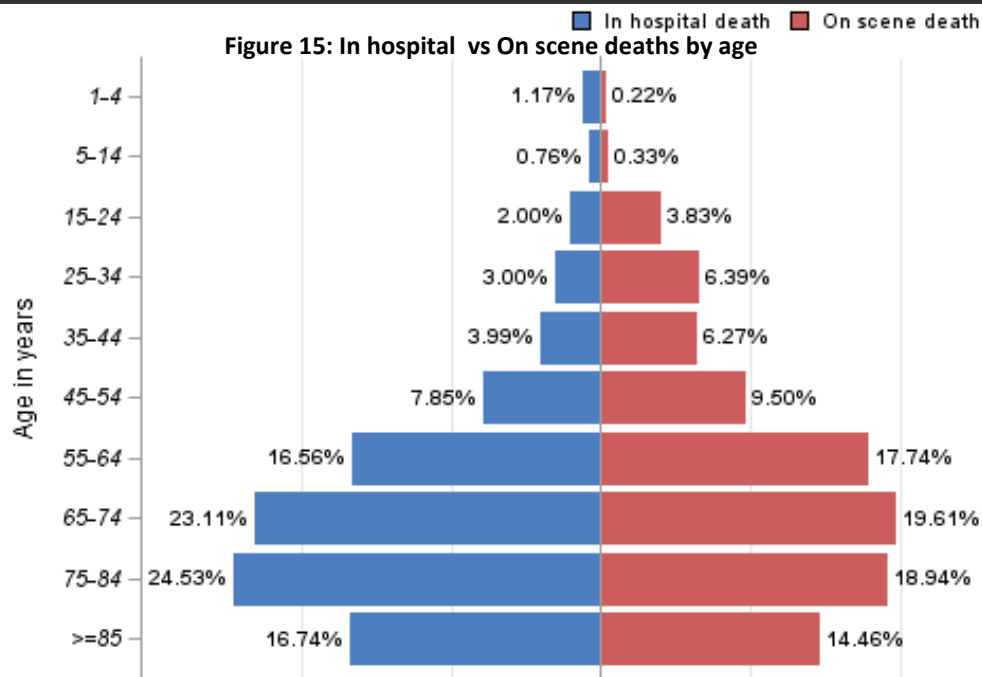
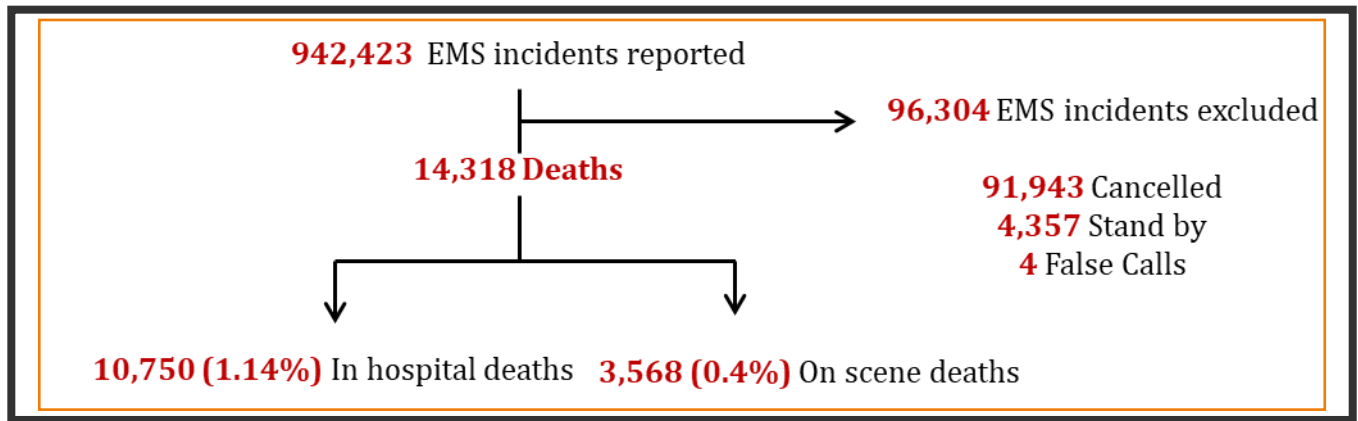
Data Source: AZ-PIERS 2018

Table 10: Urban/Rural interfacility transports rate per 100,000

Urban / Rural	Transports	Transport %	Rate per 100,000
Missing	1,804	2.97%	N/A
Urban	30,529	63.30%	509
Rural	15,973	33.39%	1,477
Out of State	166	0.34%	N/A

* Urban does not include data from Phoenix Fire

OVERALL MORTALITY - IN HOSPITAL VS ONSCENE DEATH (N= 14,318)



Data Source: AZ-PIERS 2018 & HDD 2018

Table 11: In hospital vs On scene deaths

Age	In hospital death		On scene death	
	EMS incidents	EMS incident %	EMS Incidents	EMS incident %
Missing	27	0.26%	95	2.66%
1-4	126	1.17%	8	0.22%
5-14	82	0.76%	12	0.34%
15-24	215	2.00%	137	3.84%
25-34	323	3.00%	228	6.39%
35-44	429	3.99%	224	6.25%
45-54	844	7.85%	339	9.51%
55-64	1,781	16.57%	633	17.72%
65-74	2,485	23.20%	700	19.63%
75-84	2,637	24.55%	676	18.96%
>=85	1,800	16.74%	516	14.47%
Total	10,489		3,568	

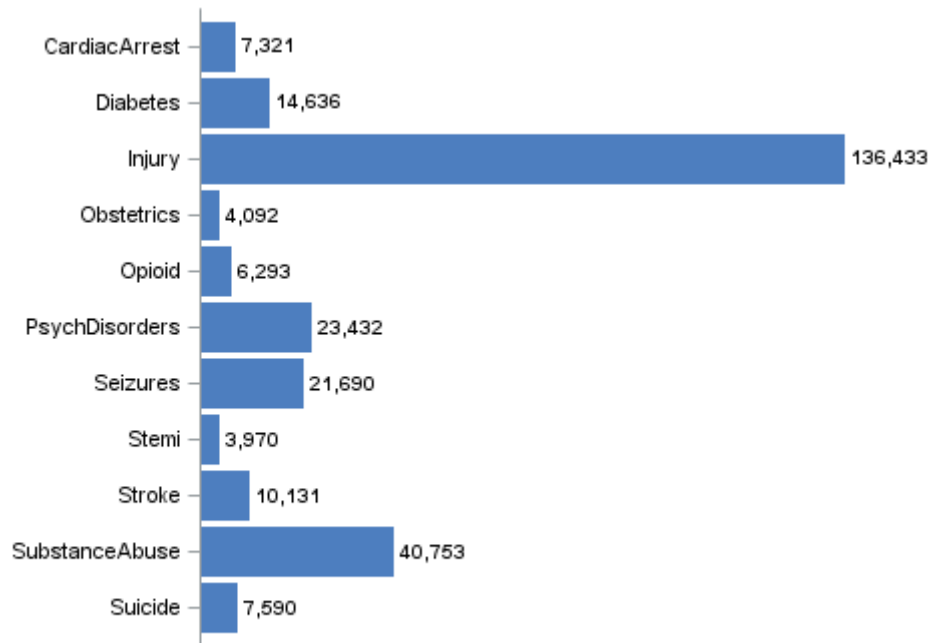
PROVIDER PRIMARY AND SECONDARY IMPRESSION CATEGORIES OF INTEREST

The impression categories included in the report have been obtained based on ICD-10 codes and CCS category descriptions. Refer to Appendix B for criteria of these impression categories.

The categories are not mutually exclusive, i.e., A single patient may have 1 or more impression category as the EMS diagnosis.

IMPRESSIONS PREVALENCE (N=842,551)

Figure 16: Prevalence of primary and secondary impression categories of interest



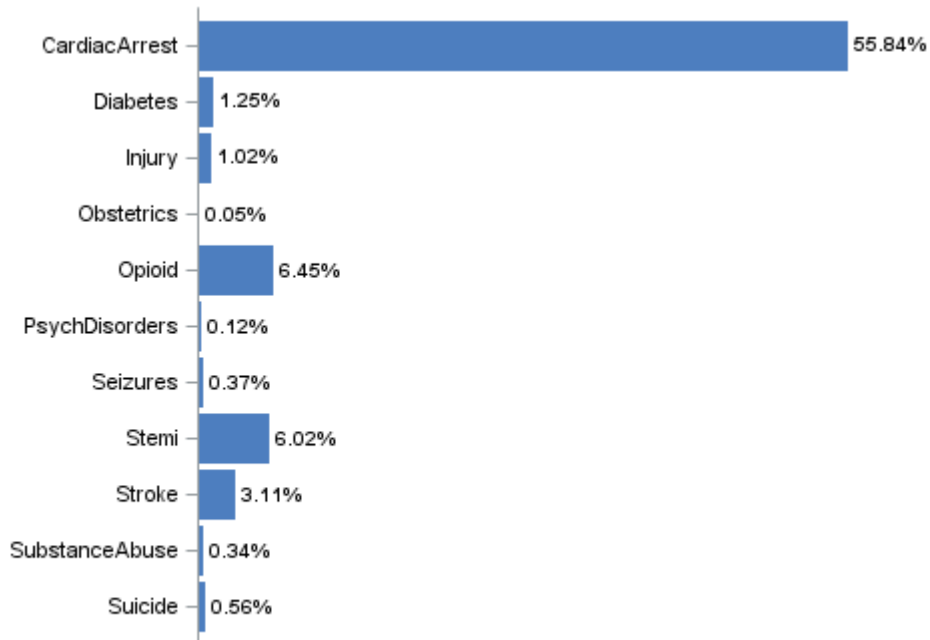
Data Source: AZ-PIERS 2018

Table 12: Prevalence of primary and secondary impression categories of interest

Population type	EMS incidents	Prevalence
Cardiac Arrest	7,321	0.87%
Diabetes	14,636	1.74%
Injury	136,433	16.19%
Obstetrics	4,092	0.49%
Opioid	7,268	0.86%
Psych Disorders	23,432	2.78%
Seizures	21,690	2.57%
STEMI	3,970	0.47%
Stroke	10,131	1.20%
Substance Abuse	40,753	4.84%
Suicide	7,590	0.90%

DEATHS IN EACH IMPRESSION CATEGORY

Figure 17: Death percentage by primary and secondary impression category



Data Source: AZ-PIERS 2018 & HDD 2018

Table 13: Deaths by primary and secondary impression category

Population type	Death count	Death percentage
Cardiac Arrest	5,556	55.84%
Diabetes	183	1.25%
Injury	1,393	1.02%
Obstetrics	2	0.05%
Opioid	427	5.8%
Psych Disorders	29	0.12%
Seizures	80	0.37%
STEMI	239	6.02%
Stroke	315	3.11%
Substance Abuse	138	0.34%
Suicide	43	0.56%

- **EMS Response Types:**

Note: These definitions are from the NEMSIS v3 Extended Data Definitions Dictionary

https://nemsis.org/wp-content/uploads/2018/09/Extended-Data-Definitions_v3_Final.pdf

- ⇒ **Medical (Convalescent) transport:** Transports that are not between hospitals or that do not require an immediate response; these are generally for the purpose of transportation to or from an appointment, performance of a procedure, or long-term care (e.g., hospital to home/hospice/rehabilitation/long-term care facility).
- Convalescent transport is defined as "a scheduled transport other than an interfacility transport" in R9-25-901
- ⇒ **Interfacility transport:** Any transfer, after initial assessment and stabilization, from and to a healthcare facility, to include specialty hospitals, for the purpose of continuation of acute care, this would also include emergent transfer requests (e.g., hospital to hospital, clinic to hospital).
- ⇒ **911 Response on Scene:** Emergent or immediate response to an incident location, regardless of method of notification (e.g., 9-1-1, direct dial, walk-in, flagging down, air ambulance scene flight).
- **Incident Disposition:** Type of disposition treatment and/or transport of the patient by this EMS Unit.
- **Provider's Primary Impression:** The EMS personnel's impression of the patient's primary problem or most significant condition which led to the management given to the patient (treatments, medications, or procedures).
- **Provider's Secondary Impression:** The EMS personnel's impression of the patient's secondary problem or most significant condition which led to the management given to the patient (treatments, medications, or procedures).

- ⇒ **Urban/Rural:**

Note: These Urban/Rural counties were grouped based on the data from the Arizona Health Status and Vital Statistics database

<http://pub.azdhs.gov/health-stats/menu/info/pop/index.php>

- ⇒ **Urban counties:** Maricopa, Pima, Pinal, Yuma
- ⇒ **Rural counties:** Apache, Cochise, Gila, Graham, La Paz, Mohave, Navajo, Santa Cruz, Greenlee, Yavapai, Coconino
- ⇒ **Out of State:** The incident did not occur in Arizona, but the EMS agencies involved where either present on the scene or were involved in the transport.

Impression Category	Criteria
Obstetrics	CCS Category description of primary or secondary impressions = Spontaneous abortion or Induced abortion or Postabortion complications or Ectopic pregnancy or Other complications of pregnancy or Hemorrhage during pregnancy; abruptio placenta; placenta previa or Hypertension complicating pregnancy; childbirth and the puerperium or Early or threatened labor or Prolonged pregnancy or Malposition; malpresentation or Fetopelvic disproportion; obstruction or Fetal distress and abnormal forces of labor or Polyhydramnios and other problems of amniotic cavity or Umbilical cord complication or OB-related trauma to perineum and vulva or Forceps delivery or Other complications of birth; puerperium affecting management of mother or Other pregnancy and delivery including normal
Psychiatric Disorders	CCS Category description of primary or secondary impressions = Adjustment disorders or Anxiety disorders or Attention-deficit conduct and disruptive behavior disorders or Developmental disorders or Disorders usually diagnosed in infancy childhood or adolescence or Impulse control disorders NEC or Mood disorders or Personality disorders or Schizophrenia and other psychotic disorders
Diabetes	CCS Category description of primary or secondary impressions = Diabetes mellitus without complication or Diabetes mellitus with complications
Substance Abuse	CCS Category description of primary or secondary impressions = Alcohol-related disorders or Substance-related disorders
Seizures	Epilepsy; convulsions
Suicide	Suicide and intentional self-inflicted injury

APPENDIX B. PROVIDER PRIMARY AND SECONDARY IMPRESSION CATEGORIES CRITERIA

Impression Category	Criteria
Stroke	Primary Impression or one of the Secondary Impressions = Non traumatic intracerebral hemorrhage or Non traumatic subarachnoid hemorrhage or Other and unspecified non traumatic intracranial hemorrhage or Cerebral infarction or Transient cerebral ischemic attacks and related syndromes or National Institutes of Health Stroke Scale (NIHSS) score or Persistent migraine aura with cerebral infarction or Cerebral aneurysm, non ruptured or Cerebral atherosclerosis or Non pyogenic thrombosis of intracranial venous system or Acute cerebrovascular insufficiency or Cerebral ischemia or Other cerebrovascular vasospasm and vasoconstriction or Cerebrovascular disease, unspecified
STEMI	Primary Impression or one of the Secondary Impressions = ST elevation (STEMI) and non-ST elevation (NSTEMI) myocardial infarction or Subsequent ST elevation (STEMI) and non-ST elevation (NSTEMI) myocardial infarction or Subsequent non-ST elevation (NSTEMI) myocardial infarction or Non-ST elevation (NSTEMI) myocardial infarction OR STEMI Probable = 'Yes' OR STEMI Triage Criteria = 'Yes' OR Cardiac Rhythm/Electrocardiography (ECG) = STEMI Inferior Ischemia or STEMI Anterior Ischemia or STEMI Posterior Ischemia or STEMI Lateral Ischemia
Cardiac Arrest	Primary Impression or one of the Secondary Impressions = Cardiac arrest or Ventricular fibrillation or Ventricular Flutter OR Cardiac Arrest During EMS Event = ("Yes, After EMS Arrival" or "Yes, Prior to EMS Arrival") Incident Disposition = Cardiac Arrest, Resuscitation Attempted (With Transport) or Cardiac Arrest, Resuscitation Attempted (Without Transport)
Injury	Situation Possible injury = 'Yes'
Opioid	Medication given description = "Naloxone or 'Narcan' or 'Naloxone Hydrochloride" And primary impression = Opioid abuse or Opioid abuse with intoxication or Opioid abuse with unspecified opioid induced disorder or Opioid related disorder or Opioid use, unspecified or Poisoning by other opioids, accidental (unintentional). OR Was naloxone/Narcan administered prior to you/your entity's arrival? Is not missing OR Was naloxone/Narcan administered by you/your entity? Is not missing